National Institute of Environmental Health Sciences

Association of respiratory virus activity and environmental factors with the incidence of invasive pneumococcal disease

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Abstract:

Objectives: To correlate the incidence rate of invasive pneumococcal disease (IPD) with fluctuations in respiratory virus activity and environmental factors in Christchurch, New Zealand. Methods: Ecological study comparing incidence rates of IPD with incidence rates of respiratory virus detection, meteorologic and air pollution data during 1995-2006. The relationship between annualized monthly rates of IPD and annualized monthly rates of respiratory virus detection and monthly meteorologic recordings and air pollution data was assessed using Spearman's rank correlation coefficient and negative binomial regression analysis. Results: Incidence rates of IPD were statistically significantly correlated with increasing detection rates of influenza viruses, respiratory syncytial virus (RSV), adenovirus and parainfluenza virus 3. Furthermore, rates of IPD were statistically significantly correlated with decreasing daily temperature, sunshine hours and wind speed, and with increasing air pollution levels and humidity. After regression analysis, the only statistically significant associations in the total population were between influenza virus activity, parainfluenza virus 3 activity and air pollution levels and increased rates of IPD, although RSV activity was associated with increased rates of IPD in children

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Precipitation, Temperature

Air Pollution: Particulate Matter

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease, Respiratory Effect

Infectious Disease: Airborne Disease

Airborne Disease: Meningitis

Respiratory Effect: Bronchitis/Pneumonia, Other Respiratory Effect

Respiratory Condition (other) : Respiratory viruses, general

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified